

WHAT IS CLAIMED IS:

1. A plasma processing apparatus comprising:
  - a processing chamber in which an inside thereof is evacuated;
  - a sample bench which is located in a lower portion of the processing chamber and on which a wafer to be processed is placed;
  - a plate having a plurality of through holes including discharge holes through which a processing gas flows into the processing chamber, the plate being disposed in an upper portion of the processing chamber in opposition to the wafer; and
  - a member which is situated in the upper portion of the processing chamber and provided with the plate on a side thereof facing the plasma, wherein electric power for forming an electric field in the processing chamber is supplied to the plate and a plasma is generated between the wafer and the plate; and
  - a light receiving unit having an optical transmitter for transmitting, therethrough a light from the inside of the processing chamber having passed the through holes formed in the plate, the light receiving unit being attached to the member situated in the upper portion of the processing chamber, and an end face of the optical transmitter being opposed to a back of the plate and the through holes so as to be one of in contact therewith and spaced therefrom by a minute gap.
2. A plasma processing apparatus according to claim 1, wherein the light receiving unit is attached to the member and is sealed thereto.
3. A plasma processing apparatus according to claim 1, wherein the member disposed in the upper portion of the processing chamber is a flat plate member which is disposed in parallel with the wafer being opposed thereto.

4. A plasma processing apparatus according to claim 3, wherein the light receiving unit is attached being to the member and is sealed thereto.

5. A plasma processing apparatus comprising:  
a vacuum chamber;  
a sample bench which is located in a lower portion inside of the vacuum chamber and on which a wafer to be processed is placed;  
a plate which is situated in an upper portion inside of the vacuum chamber so as to be opposed to the wafer and is supplied with electric power for forming an electric field in the vacuum chamber; and  
a plurality of through holes including discharge holes formed in the plate through which a processing gas flows into the vacuum chamber, a plasma being generated between the plate and the wafer;  
a member which is situated in the upper portion of the vacuum chamber and provided with the plate on the side thereof facing the plasma; and  
a light receiving unit having an optical transmitter for transmitting, therethrough a light inside of the vacuum chamber having passed the through holes penetrating the plate, the light receiving unit being attached to the member situated in the upper portion of the vacuum chamber, and an end face of the optical transmitter being opposed to the back of the plate and the through holes so as to be one of in contact therewith and spaced therefrom by a minute gap.

6. A plasma processing apparatus according to claim 5, wherein the light receiving unit is attached to the member and is sealed thereto.

7. A plasma processing apparatus according to claim 5, wherein the member disposed in the upper portion of the vacuum chamber is a member held to the vacuum chamber.

8. A plasma processing apparatus according to claim 7, wherein the light receiving unit is attached to the member and is sealed thereto.

9. A plasma processing apparatus according to claim 5, wherein the member disposed in the upper portion of the vacuum chamber is a flat plate member which is disposed in parallel with the wafer being opposed thereto.

10. A plasma processing apparatus according to claim 9, wherein the light receiving unit is attached to the member and is sealed thereto.

11. A plasma processing apparatus according to claim 9, wherein the member disposed in the upper portion of the vacuum chamber is a member held to the vacuum chamber.